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About Algeria, Algiers, Tlemçen, Constantine, Biskra, Timgad.

By Charles Thomas-Stanford. 302 pp. Map, ill., index. John Lane Co., New York, 1912. \$1.50. $7\frac{1}{2} \times 5\frac{1}{2}$.

The author is a wide-awake traveler who made a rapid trip through these parts of North Africa in a motor-car. He gleaned many things of interest to anyone who contemplates a similar visit. Many picturesque glimpses of Algeria are presented in a rather rambling and original style of writing. The chapters on the "Alluring Oasis" and the "Sahara" are the best. The former is inspired chiefly by Biskra, which the author christens "Hichenstown," and the latter by the vastness of the waste which makes up over ninety per cent. of Algeria. In Timgad of the desert, a city destroyed some twelve centuries ago, interesting and impressive structures have been unearthed, and among these is a Roman library "bequeathed by Marcus Julius Quintianus Flavius Rogatianus, of senatorial memory," whom the author dubs a "Roman Carnegie." Throughout the narrative stories of invasions, historical incidents and descriptions of peoples and customs are interspersed.

ROBERT M. BROWN.

Man and Beast in Eastern Ethiopia. From Observations made in British

East Africa, Uganda, and the Sudan. By J. Bland-Sutton. xii and 419 pp. Ills., index. The Macmillan Co., New York, 1911. \$4. 9×6 .

This readable book is a running comment upon travels in British East Africa, Uganda, and the Sudan. All travelers have a bias for one thing or another, and Mr. Bland-Sutton has devoted a large portion of his book to animals, especially birds. These descriptions are in no sense technical but are what would be expected from an observant traveler who is especially interested in animal life. The descriptions of the various tribes encountered in the travels are interesting. Their habits, food, social customs and other features are described as the author saw them.

Two chapters have especial interest for students of earth science. One chapter deals with the great Rift Valley of Africa. This trench, a relatively narrow downthrow fault block, has sides so steep that "the traveler may suddenly come to the edge * * * and run a risk of tumbling over." The sunken block is itself broken, giving a series of fault escarpments on the valley floor. Chapters are given to the interesting extinct volcanoes of the region of which a few are described. The scarcity of helpful maps is somewhat annoying. F. V. EMERSON.

ASIA**La Géologie et les Richesses Minérales de l'Asie.** Historique—

Industrie—Production—Avenir—Métallogénie. Par L. de Launay. 816 pp. Maps, index. Ch. Béranger, Paris, 1911. Fr. 35. $9\frac{1}{2} \times 6\frac{1}{2}$.

In order properly to judge this book one ought to know the earlier work of the same author on the Mineral Wealth of Africa of which this is a continuation. The author's purpose is to establish a connection between the geological structure of the Asiatic continent and the occurrences of minerals, and he designates this special line of work by the term "metallogenics." This name does not appear adequate, and it is not easy to understand why the seemingly more appropriate name of mineralogenics was not chosen; for it is the genesis of minerals in general, not of metals alone, which the author investigates. Therefore, the words metalliferous, metalogenic, etc., must in most places be understood as mineral-bearing, or mineral-forming, etc.

The author tries to throw light on isolated local mineral occurrences by means of general ideas founded on the synthetic study of large areas. He wishes to determine the relation between the mineral-bearing strata of a country and the whole of its tectonics, and again the relation of the latter to certain geological processes, the ages of which must be ascertained as accurately as possible. In this way the "metalliferous" strata are studied, as it were, in their environment, and Asia is an especially favorable object for such studies for two reasons: first, because it shows very clearly the contrast between the metals

formed at great depths by geological pressure, and the more superficial incrustations in fissures; secondly, because it illustrates to perfection the effects of the continental extent of those processes. In this way the author finds it possible to establish "metalliferous" provinces and to describe their regional aspects and determine their relations with certain geological phenomena. The age of the later being known in most cases, that of the minerals, too, may be determined with tolerable accuracy.

The first part contains the economic and industrial facts; it describes the past, present, and future, of mining industries in Asia. The second part is given over to "metallogenics," *e. g.* "the genesis of useful minerals" (p. 4). It consists of a general and a special part: the former is mainly geological, including a geological history of Asia, a division of Asia into great natural "provinces" with individual conditions of folding, dislocations, igneous intrusions, metamorphism, and erosion, as well as sedimentation. The latter part is subdivided into two parts again, corresponding to the fundamental difference in "metallogenic" processes: igneous or hydrothermal processes, which account for almost all the metal-bearing strata, and sedimentary action, which produces salt, etc.

The *leitmotiv* of the book is to show that the "metalliferous" strata of one and the same "province" exhibit common characteristics, owing especially to the medium depth at which crystallization took place, and how these conditions have a tendency to repeat themselves in other provinces of similar nature. Four types of such "metallogenic" provinces are distinguished:

1. The first type may be explained by imagining a zone of rock crystallized at from ten to thirty kilometers below the surface. The product would be some kind of granitic rock surrounded by metamorphic gneisses. This type will be exposed to view wherever the land is worn down low enough, and its best examples in Asia are the Angara Plateau in Siberia, Gondwana area in India, the Sinian batholith in Korea-Pechili, etc. In these "provinces" are found two types of "metallization," both characteristic for great depths: igneous impregnations, which elsewhere appear in large masses, appear here interstratified as very small veins among the layers of schistose rocks, and they are accompanied by gold, copper, and nickel.

2. At a somewhat higher level within the earth's crust there is an abundance of granulites (the author gives no definition of what he understands by that much discussed name), fine-grained granulites, and micro-granulites which higher up pass into diabases, porphyrites, etc. These three groups have a tendency to form dikes and veins rather than homogeneous masses, and are especially well formed in the so-called Hercynian chains of which the Ural and Altai Ranges, Indo-China, and Malacca are the best Asiatic examples. The massive granulites contain tin as a rule, the fine-grained ones; antimony, the micro-granulites; lead, zinc, copper.

3. Still higher in the crust is the region of the third "province." It lies probably at the base of the recently folded chains, and is a zone rich in dislocations which are not necessarily connected with the folding processes, but have occasionally broken the already existing folds. Along the fault-lines, eruptions of andesites and trachytes have taken place. These provinces are rich in minerals: gold, silver, copper, quartz, especially in North America. In Asia the Colorado type is repeated in Japan, and partly also in Armenia and the Anti-Caucasus.

4. The fourth "province" corresponds to the folded chains proper, in which tectonic forces play only a subordinate part. They are characterized by the almost complete absence of minerals, such as the Jura Mts. in France, and the northeastern Caucasus and certain parts of the Himalayas represent it in Asia.

No important mineral deposit has been produced by an active volcano. Wherever minerals are found in zones of recent volcanic activity, they date from an earlier period. The "metalliferous" zones always have their origin at the greater depths, and in many cases the age of a chain is not that of the formation of the minerals it contains, because it is not the process of folding but that of dislocation which produced the latter. The book is profusely illustrated with maps and diagrams, and two indices, one each of subjects and of geographical names, greatly facilitate its use.

M. K. GENTHE.